REPORT

of the

FIFTEENTH NORTHEASTERN CORN IMPROVEMENT CONFERENCE

New York City
March 11 and 12, 1960

Reported by
H. L. Everett, Secretary Prom tem.
for G. F. Sprague, Sec.

Crops Research Division
Plant Industry Station, Beltsville, Maryland
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REPORT OF THE FIFTEENTH NORTHEASTERN CORN IMPROVEMENT CONFERENCE

New York City, New York
March 11 and 12, 1960

The meetings were held in the Henry Hudson Hotel. A total of 30 workers representing 10 states, the U. S. Department of Agriculture, 2 Canadian Provinces, and 2 producers of open-pedigree hybrids were in attendance.

AFTERNOON SESSION, MARCH 11

The meeting was called to order by Chairman M. W. Johnson, at 1:10 p.m. It was announced that Dr. G. F. Sprague, Conference Secretary, had been called home. The Chairman requested H. L. Everett to serve as secretary pro tem.

A nominating committee was appointed by the Chairman as follows: J. C. Anderson, Chairman; D. L. Matthews, and H. M. Yegian. The Conference then proceeded to a consideration of the discussion topics listed on the final program notice.

Cooperative Stalk Rot Project

C. W. Boothroyd

The summarization included a preliminary report on behalf of the cooperating stations, Connecticut, Maryland, New Jersey, New York, and Pennsylvania. In addition, these materials were introduced:

(1) Survey of disease, insect, and bird problems in Northeastern United States and Canada.

(2) A formulation for the protection of seed from animal damage, by Donald A. Spencer, Biologist, Wildlife Research Laboratory, Bureau of Sport Fisheries and Wildlife, Denver, Colorado.

(3) Wildlife Leaflet 409, Bird Control Devices, U. S. Department of the Interior, Bureau of Sport Fisheries and Wildlife.

(4) Protecting Corn from Blackbirds, R. T. Mitchell and J. T. Linehan.

(5) The Rope Firecracker, A device to protect crops from bird damage.

Two questions were asked of the conferees. What is the value of this information? Should the program be continued? There was general comment on the usefulness of the data achieved to date and considerable interest in continuing the program. Anderson noted that seed would be available for 3-4 complete trials in 1960. Further discussion was postponed until the report of the committee on stalk rot.

Survey of Disease, Insect, and Bird Problems in Northeastern United States and Canada

C. W. Boothroyd

A survey was made of disease, insect, and bird problems of corn in northeastern United States and Canada. The following is a summary of the response to this survey submitted by Northeastern Conference members from Harrow, Ottawa, and Montreal, Canada; and from Connecticut; Maryland; Massachusetts; New Hampshire, New Jersey; New York; West Virginia; and Pennsylvania.

Diseases

Seed decay and seedling blights are not a problem, largely as a result of chemical treatment of seed before planting. The captans and thirams are most commonly used as protective fungicides.

Stalk and root rot continues to be a serious problem and was bad in 1959. Most of our members believe that breeding for good stalk standability is our best approach to control. We have some good stiff-stalked corn hybrids, but we need more and better ones. Planting of full season hybrids and harvesting of grain as early as possible are suggested.

Corn smut, Helminthosporium blights, Stewart's bacterial wilt, and rust occur in the northeast almost every year, but these diseases are of minor importance. Any one of these diseases could become destructive locally, or even generally. Continued attention must be given to breeding for resistance. Additional control measures for some of these diseases have proved effective.

Ear rots and storage diseases are not a problem in the northeast although some trouble occurs locally in some years.

Insect Pests

Seed corn maggot and wireworm may be troublesome in the seed and seedling stage, but these insects are controlled by use of seed treatment chemicals (maggot and wireworm) or by application of soil treatment chemicals (wireworm).

Corn borer damage is the most serious insect problem in the northeast, varying from year to year and from locality to locality. Severity can be reduced by appropriate cultural practices, by timely insecticide applications, and by continued selection for tolerant and resistant hybrids.

Aphids, earworm, Japanese beetle, flea beetle, root worm, and storage insects are a minor problem generally, but do cause damage in some areas, e.g., aphids in Connecticut and Pennsylvania and Harrow, Canada, and Japanese beetle and storage insects in West Virginia. Earworm may be troublesome in some years. Selection for resistance to aphids, and use of recommended chemicals for control of the other insect pests is recommended.

Bird Damage
(Crows, blackbirds, grackles and pheasants)

Bird damage to seeds and seedlings and to maturing grain is serious in the northeast, although most of the troublesome areas are restricted to land along creeks and rivers, near marshes, and close to wooded sections. Control measures to date have been relatively unsuccessful. Good control of birds in early season by use of Goodrich ZIP as a seed treatment has been reported from Connecticut, Maryland and Montreal, Canada. Other repellants, e.g., thiram fungicides, coaltar derivatives, have met with varied success.

Control of bird damage on grain corn has been less successful. Promising repellants for use on maturing grain have proved uneconomical. Automatic exploders, firecracker ropes, and guns have been of some help. Scratch feed or poisoned grain is used in some localities. The conservation department at New Hampshire has built electrified fences and furnished dead crows to farmers to scare away birds. Selection of hybrids for tight husks has been somewhat promising.

Table 1. Recommendations for use of chemicals on corn in the northeastern United States and Canaga.

Problem	Recommendation
Seed decay and seedling blight	Seed treatment before planting: captan, 3/4 oz. per bu., thiram, 1 oz. per bu. or other recommended fungicide. (Use with insecticide and bird repellant).
Stewart's wilt (flea beetle)	If forecast warrants, DDT - 1½ to 2 qts. of 25% emulsifiable concentrate, 8-15 gals. per acre, for control of flea beetle on seedling corn. Repeat applications as recommended.
Seed corn maggot	Seed treatment: Lindane, dieldrin, heptachlor, or aldrin--1/4 oz. per bu. (Use with fungicide and bird repellant).
Wireworm	Same as for maggot if light infestation. If heavy, soil treatment before planting--aldrin, 3 lbs. per A., chlordane, 5-6 lbs. per A., dieldrin or heptachlor, 2 lbs. per A.
Corn borer	If not fed for silage, DDT--3 qts. 25% E.C., or 40 lbs. 5% dust, or 5% granular, or if fed, Ryania--40% dust, 30 to 40 lbs. per A., in whorl and tasselling stages at recommended intervals.
Corn earworm	If not fed, DDT--3 qts. 25% E.C. and 3 to 4 qts. mineral oil at 25 gals. per A., at recommended intervals after silking.

Table 1. (cont'd.)

Problem	Recommendation
Aphids	Malathion or parathion -- 1 pt. 25% E. C. in addition to DDT sprays, if necessary.
Japanese beetle	DDT on lawns and pastures for grubs, and on corn, if not fed, for adult beetles.
Storage insects (Angoumis grain moth Rice weevil)	Fumigation--if corn is fed, pyrenone; if not fed, DDT.
Bird damage (seeds and seedlings)	Seed treatment before planting, Goodrich ZIP with fungicide and insecticide, 50% ZIP to 50% other.

Work on Dwarf bs. Normal Corn for the Past Year

J. C. Anderson

The report and commentary are attached. After this information was presented, there appeared to be concurrence in the findings by several other stations. In field population studies, Gorsline reported a parallel response to dwarf and normal hybrids with reduced yields above 25,000-30,000 plants. Yegian stated that shelling percentage appears to average lower for dwarfs when compared to normal controls. Matthews suggested that the narrow germ plasm base for the dwarf gene (br_2) may be a significant factor in the reduced yields associated with the dwarf hybrids.

There followed a discussion of the possibilities of using semi-dwarf hybrids. Certain dwarfs are reported to be prolific in nature and may be desirable in semi-dwarf hybrid combinations. The next topic on the agenda was skipped temporarily and item 4 considered.

Dwarf bs. Normal Corn Hybrids in New Jersey - 1959

J. C. Anderson and C. R. Funk

OBJECTIVE: Dwarf corn if adapted will probably replace equal acres of normal corn. Hence, a test was conducted to compare performance of dwarf hybrids with the normal hybrids they must replace.

PROCEDURE: Tests were located in South, Central and North Jersey in Gloucester, Middlesex, and Warren Counties respectively. The ten entries were randomized on six factorial whole plots composed of two levels of fertility and three plant populations, 10M, 15M and 20M with 1, 1½ and 2 plants per hill. The plots were four rows with the two middle rows harvested. Row spacing was 26" in Warren and 42" in the other counties. Fertility levels were (1) the farmer's and (2) the farmer's plus 50 pounds of N at lay-by time. All three locations had a high fertility level. Non-harvestable broken plants were those so broken that a mechanical picker was not likely to get the ear. Entry No. 10 differed for each location because of a shortage of seed. Lack of interaction prompted the use of the six whole plots as six replications in each location.

SEED SOURCES:

Eastern States Farmer's Exchange West Springfield, Mass.	Pa. 602 normal E.S. 602 dwarf
Grange League Federation, Ithaca, New York	U. S. 13
Illinois Seed Producers, Urbana, Illinois	Illidwarf 503, 513
N.J. Crop Improvement Assoc., Allentown, N.J.	N.J. 9, N.J. 11
Pfister Associated Growers, Aurora, Illinois	P.A.G. 12003, 12017, 12021, 12028, 12030

Dwarf vs. Normal corn hybrids - 1959 -- New Jersey

	Yield of Grain bu./A				% Moisture in Grain at Harvest				Ear Height in inches				Ear Quality rating*			
	Glou-cest-er	Mid-dle-sex	War-ren	Mean	Glou-cest-er	Mid-dle-sex	War-ren	Mean	Glou-cest-er	Mid-dle-sex	War-ren	Mean	Glou-cest-er	Mid-dle-sex	War-ren	Mean
Normal																
N.J. 9	116.1	103.7	146.0	121.9	20.4	24.6	29.8	24.9	43	44	50	45	2.6	2.7	0.5	1.9
Pa. 602	86.5	78.5	122.2	95.7	13.4	16.3	21.4	17.0	34	33	37	35	4.0	3.8	1.0	2.9
U.S. 13	100.6	90.7	132.2	107.8	16.1	20.3	27.4	21.2	41	44	55	48	3.6	3.5	0.8	2.6
N J. 11	92.0	90.9	127.9	103.6	16.2	18.7	23.6	19.5	35	39	41	38	3.6	3.2	0.8	2.5
Dwarf																
P.A.G. 12021	83.4	78.2	105.3	89.0	17.3	19.9	29.0	22.1	16	19	20	18	3.6	3.5	1.0	2.7
" 12028	71.2	65.1	80.5	72.3	17.4	20.6	27.8	21.9	14	16	17	16	3.3	3.8	1.6	2.9
Illidwarf 503	69.4	60.9	85.8	72.0	15.4	19.4	26.2	20.3	15	18	18	17	3.6	3.8	2.0	3.1
" 513	72.0	66.8	91.8	76.9	15.4	19.2	23.1	19.2	17	21	21	20	4.6	3.7	2.5	3.6
Pa. 602	79.6	73.8	99.9	84.4	15.8	19.2	24.7	19.9	16	20	22	19	3.6	4.0	1.3	3.0
P.A.G. 12030	75.0	----	----	----	16.5	---	----	----	13	--	--	--	4.6	---	---	---
" 12003	-----	----	83.8	----	----	----	26.0	----	--	--	15	--	---	---	1.7	---
" 12017	-----	62.7	----	----	----	19.2	----	----	--	16	--	--	---	4.0	---	---
L.S.D. at 5%	5.1	4.0	7.4		1.1	0.8	2.2									
1%	6.6	5.2	10.0		1.5	1.1	3.1									
C.V. %	5.3%	6.4%	5.7%		8.6%	5.2%	5.0%									

* Ear quality rating 1 - 5, 1 is sound.

Dwarf vs. Normal corn hybrids -- 1959 -- New Jersey

	% Broken Plants				% Non-harvestable Broken Plants				% Weed Cover				Mean Height Weed Cover in Inches			
	Glou-cester	Mid-dle-sex	War-ren	Mean	Glou-cester	Mid-dle-sex	War-ren	Mean	Glou-cester	Mid-dle-sex	War-ren	Mean	Glou-cester	Mid-dle-sex	War-ren	Mean
Normal																
N.J. 9	39	22	8	23	37	11	6	18	34	15	1.5	16.8	Not	1	9	5
Pa. 602	25	23	8	19	24	19	6	16	70	68	6.1	48.0	taken	3	14	8
U.S. 13	50	64	17	44	40	36	8	28	48	30	3.0	27.0		2	14	8
N.J. 11	35	34	8	26	33	20	6	20	67	42	5.7	38.2		2	17	9
Dwarf																
P.A.G. 12021	18	12	1	10	3	11	0	5	72	70	11.0	51.0		3	26	14
" 12028	12	10	3	8	4	9	2	5	92	82	16.0	63.3		4	28	16
Illidwarf 503	11	10	1	7	2	9	1	4	73	73	9.5	51.8		3	23	13
" 513	39	33	13	28	15	28	11	18	90	63	14.3	55.8		2	24	13
Pa. 602	27	31	10	23	10	29	10	16	82	72	6.1	53.4		3	16	9
P.A.G. 12030	8	--	--	--	1	--	--	--	95	--	---	----		-	--	--
" 12003	--	--	2	--	--	--	2	--	--	--	20.8	----		-	25	--
" 12017	--	5	--	--	--	4	--	--	--	85	----	----		4	--	--

COMMENTARY:

Yield of grain

1. Dwarfs do not compete with current normal hybrids in New Jersey either as a group or in direct comparison.
2. No apparent interaction with location.

% moisture in grain at harvest

1. No apparent interaction with location.
2. Pa. 602 dwarf 4-6 days later in maturity than Pa.602 normal.
3. U.S. 13 and Illidwarf 513 not different in maturity.

Ear height in inches

1. Dwarfs in general about 1/3 to 1/2 as high as normal corn.
2. No interaction with location.
3. Minimum ear height of 13 inches acceptable for mechanical harvest if ear is upright. If ear droops minimum acceptable height is about 22 inches. All these dwarfs had drooping ears.
4. Unfavorable or mediocre growing conditions make dwarfs too low-eared.

% broken and non-harvestable plants

1. Practically all broken plants caused by stalk rot.
2. No interaction between hybrid and location in broken plants.
3. Interaction probable between hybrid and location in non-harvestable broken plants.
4. Lower center of gravity of dwarfs not sufficient to tolerate all levels of stalk rot.

Ear quality

1. Low ear quality is associated with high stalk rot incidence and lower ear height of dwarfs. Much ear rot was from tip resting on soil.
2. Low ear quality of normal corn associated with high stalk rot level indicated by many non-harvestable ears.

% weed cover and mean weed height

1. Weed problems after lay-by are accentuated in dwarf corn and early maturing (i.e. shorter) hybrids.
2. The taller weeds associated with dwarf corn contribute to difficulty in mechanical harvesting.

Objectives to Consider When Breeding Corn for Silage

J. W. Bratzler

When breeding corn for silage, the following objectives appear to be of greatest importance:

1. Selection of the hybrid which will produce the highest yield of dry matter per acre.

2. Selection of the hybrid whose nutritive value, TDN or Digestible Energy, will be highest per pound of dry matter.

3. Selection of the hybrid which will have the optimum dry matter content for ensiling purposes, 27 to 30%, at the same time that the yield of TDN or Digestible Energy per acre is highest.

Consideration can be given now to results which are available in order to ascertain at least some of the factors that must be evaluated to attain the above objectives. The results supplied by Dr. J. B. Washko provide valuable information with regard to the effects of date of harvest and plant population upon the yield of dry matter per acre and the dry matter, crude protein, and crude fiber contents of three corn hybrids.

The three hybrids, Pa. 444, Pa. 602A, and U.S. 13, grown at populations of 20,000, 50,000, and 100,000 plants per acre, were harvested 66, 80, 95 and 108 days after planting. Almost without exception, dry matter yield was highest and about equal for the two highest plant populations, irrespective of the hybrid, for the first three dates of harvest. At the last date of harvest, the lowest plant population produced the highest yields of dry matter for all hybrids. Dry matter content was lowest for all plant populations and all hybrids at 66 days, 10.6 to 15.1%; increased slightly at 80 days, 13.4 to 16.8%; increased much more at 95 days, 17.5 to 25.2%; and was highest at 108 days, 22.2 to 35.8%. Dry matter content was highest at 108 days for all hybrids for the lowest plant population. For all plant populations and hybrids the largest increases in dry matter content occurred between the last two harvest dates. Crude protein contents for all populations and hybrids were highest at 66 days, 14.1 to 16.2%; declined significantly at 80 days, 11.9 to 15.2%; declined significantly at 95 days, 10.3 to 12.3%; and were lowest at 108 days, 8.6 to 11.9%. Crude fiber contents for all plant populations and hybrids

were highest at 66 days, 27.9 to 32.7%; declined only slightly at 80 days, 27.9 to 31.5%; declined only slightly at 95 days, 26.7 to 31.2%, excluding one value of 21.8%; and were lowest at 108 days, 20.3 to 27.3%. Lowest crude fiber values were exhibited by all hybrids for the lowest plant population at 108 days, 20.3 to 22.2%. The crude fiber content of corn hybrids appears to be correlated inversely with grain production - the higher the production of grain the lower the crude fiber value for the whole plant.

Pa. 602 and Dwarf 602 corn hybrids were harvested in 1959 at three stages of maturity; milk (August 20), full dent (September 3), and early glaze (September 14). These six forages were ensiled in 4' x 8' experimental silos and the resulting silages will be evaluated nutritionally in the near future. The samples obtained for the determination of dry matter yield were separated into the plant parts of leaf, stalk, husk, and ear. These samples of plant parts and samples of the whole plant, obtained at the time of ensiling, were subjected to complete proximate chemical analyses.

Dry mattercontents for the Pa.602 and Dwarf 602 hybrids on August 20, September 3, and September 14 were: 19.2 and 18.9%, 22.6 and 23.9%, and 30.7 and 30.8%, respectively. Crude protein values declined significantly with advancing stage of maturity as did the crude fiber values. Crude fiber values of 20.8 and 20.3% were obtained on September 14. Ether extract values and nitrogen-free extract values increased significantly with advancing stage of maturity. Gross energy values of the dry matter were significantly lower at the earliest stage of maturity.

Total dry matter yields for the Pa. 602 andDwarf 602 hybrids on August 20, September 3, and September 14 were: 5.82 and 5.17, 6.14 and 5.27, and 6.79 and 5.90 tons per acre, respectively. Percentages of dry matter contributed by the plant parts for the Pa.602 and Dwarf hybrids on August 20, September 3, and September 14 were: 24.4 and 29.7, 20.0 and 17.2 and 20.7% by the leaf; 29.0 and 27.1, 25.7 and 19.9, and 20.4 and 17.3% by the stalk; 13.9 and 16.8, 9.1 and 9.8, and 7.9 and 8.5% by the husk; and 32.7 and 26.4, 45.2 and 45.4, and 54.5 and 53.4% by the ear, respectively.

When the results of the chemical analyses of the leaf, stalk, and husk were combined, it was shown that the composition of these three parts of the corn plant was affected but little by the stage of maturity. Only small but significant declines in protein values were noted. On the other hand, the composition of the ear showed significant changes with advancing stage of maturity. Ether extract and

nitrogen-free extract values increased significantly, crude fiber values declined significantly, and crude protein values declined only slightly. It immediately becomes obvious when considering the composition of the plant parts and the yield by plant parts that the composition of the ear exerts an effect on the composition of the whole plant which becomes greater with advancing stage of maturity.

At the present time there is a paucity of data concerning the nutritive value of silage made from many of the popular corn hybrids. On the basis of our own results and a few results from Virginia, it appears that silage made from corn harvested at the optimum stage of maturity should have TDN or Digestible Energy values between 70 and 75%. There is little reason to expect that the nutritive value of silage made from corn will not depend on its composition as has been demonstrated time and again with hays and silages made from legumes and other grasses. As these latter forage plants mature, they increase significantly in crude fiber content and decline significantly in crude protein content with a simultaneous significant decline in nutritive value. If we look upon the corn plant as a source of high energy feed, we should not be too concerned with its protein content, but rather with the significant decline in crude fiber and significant increase in nitrogen-free extract which have been shown to occur as it matures. These changes in composition definitely favor the production of a more digestible feed which can be utilized more efficiently by livestock.

In their selection of hybrids it would seem logical for corn breeders to strive for:

1. Maximum yield of dry matter for silage at:

    a. full dent to early glaze stage of maturity.
    b. dry matter content of 27 to 30%.

2. Maximum yield of TDN or Digestible Energy by:

    a. increasing the gross energy of the corn plant by breeding for a higher fat content in the grain.

    b. increasing the digestibility of the corn plant by:

        (1) breeding for a higher nitrogen-free extract content.

        (2) breeding for a lower crude fiber content.

There followed a general discussion of the implications of feed value and plant composition. It was suggested that a protein supplement would be required for any corn-grain or silage-feeding schedule.

R. Anderson reported data from New York tests carried out at various plant populations up to 175,000 plants per acre. These tests included several entries of annual forages in addition to diverse corn hybrids. Feeding evaluations are now in progress. There was interest expressed in forming a committee on silage research. This committee would report to the conference on silage studies with high stalk sugar hybrids, artificial rumen techniques and related research.

Summary of Recent Work on Restoring Pollinators for Sterile Seed Parents

D. F. Jones

Present information indicates that the important factor in transferring restorers to male parents is to regain the agronomic qualities of the original germ plasm. In this case yield is often regained before stalk quality is achieved. Four generations of back-crossing are apparently inadequate in many cases.

Jones also stated that the use of single letters in nomenclature related to the cytosterile-restoration system appears to be widely acceptable.

Crum reported on studies in progress related to the West Virginia hybrid B25. Brawn reported limited data which indicate the "T" sterile seedlings subjected to heat treatment show 6% normal pollen production while normal controls remain completely sterile.

An added topic was considered briefly:

Machine Plantings of Field Plots -- E. C. Rossmand and M. W. Johnson

Slides were shown to illustrate the equipment presently in use. The mechanical planters for field tests successfully eliminates hand planting and thinning from field operations. Five acres in plots can be handled by a two-man crew in a single day. The seed must be preprocessed. Rossman uses adressograph equipment for numbering up field packages. Field plots are single rows 33' long.

After this topic consideration, the meeting adjourned to provide an opportunity for the standing committees to meet and develop plans and reports.

EVENING SESSION, MARCH 11

Following a dinner in the West Room of the Henry Hudson Hotel, Chairman M. W. Johnson called upon H.L.Everett to recognize the contributions of Dr. D. F. Jones to the conference. Dr. Jones will retire in 1960, and hence, this was his final year as an official delegate to the conference. The conference gave Dr. Jones a standing ovation at the conclusion of this brief recognition.

Next, Chairman Johnson introduced the banquet speaker, E. J. Dollinger, who offered a consideration of the subject: Mutable Genes. This highly technical presentation explained how the various mutating agents or genes (e.g., activator) cause specific gene change in association with the Ds locus. A model for the use of this complex system in obtaining stalk rot resistant lines was presented. This project stimulated considerable comment and question among the conferees.

MORNING SESSION, MARCH 12

The meeting was called to order by Chairman Johnson at 9:00 a. m. Committee reports were called for from the various chairmen. These reports follow in the order of presentation: (All reports were moved, seconded and approved).

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 100-200 MATURITY

Ten experimental hybrids selected from 1958 performance trials were tested in 1959 at six stations including Maine, New York, Pennsylvania, Eastern States Farmers' Exchange, Macdonald College, Quebec, and Ottawa, Ontario. The data for grain yield and moisture content at harvest have been summarized and a copy handed to the secretary with this report.

None of the experimentals tested are recommended for N. E. designation. However, additional seed is available for further testing if required.

The following motion was passed at the 1958 conference, "That the committee for the 100-200 maturity series be empowered to set new maturity standards."

The maturity (as measured by % H_2O) of the ten experimentals in the 1959 tests was comparable to that of A.E.S. 101, but 3 to 5 percent lower than A.E.S. 201, Wisconsin 270 and Penn. 215. The committee recommends, therefore, that A.E.S. 101 be used as the standard of maturity for the 100 maturity series.

That any hybrid accepted for N.E. designation be given a 100 number, if its percentage moisture is not significantly higher than this new standard.

With the presentation of this report the chairman submits his resignation and requests the conference to nominate a new committee chairman.

F. Dimmock, Chairman
R. Brawn
R. M. Bailey

The conference chairman appointed W. I. Thomas as chairman of this committee and added H. L. Everett to the committee for 1960.

NORTHEASTERN CORN IMPROVEMENT CONFERENCE
UNIFORM TESTS, 100-200 MATURITY
SUMMARY, 1959
BUSHELS PER ACRE & GRAIN MOISTURE AT HARVEST

Hybrid	Macdonald[1] College, Que.		Penn.[2]		Tompkins Co. N.Y.		Manmouth[3] Maine		E.S.F.E. Mass.		Ottawa[1] Ont.		Average % H_2O	Bus.
	Bus.	% H_2O	Bus.	% H_2O	Bus.	% H_2O	Bus.	% H_2O	Bus.	H_2O	Bus.	H_2O	% H_2O	Bus.
DC1 - (WDxCO110)(CO111xCO109)	78.0	28.9	93.0	19.3	78.9	25.0	71.0	45.0	86.0	25.6	106.1	24.3	24.6	85.5
DC2 - (WDxCO109)(CO106xW59E)	72.5	25.1	98.0	18.1	82.4	28.0	73.0	43.0	75.0	26.1	102.0	22.4	23.9	83.8
DC3 - (WDxCO111)(CO110xCO109)	77.2	25.5	94.0	19.4	74.6	26.6	76.0	44.0	84.0	25.2	99.9	23.1	24.0	84.3
DC4 - (WDxW59E) (CO106xCO109)	71.7	25.0			81.0	23.9	69.0	42.0	76.0	27.8	98.3	21.0	24.4	79.2
DC5 - (WDxCO106)(CO109xW59E)	72.5	24.0	95.0	17.6	90.3	22.4	75.0	41.0	82.0	24.0	99.3	21.8	22.0	85.7
DC6 - (WDxCO107)(CO106xCO109)	84.1	23.8	87.0	16.6	72.9	19.2	67.0	42.0	76.0	25.9	96.1	20.0	21.1	80.5
DC7 - (WDxCO110)(CO107xCO109)	82.4	27.0	89.0	18.0	74.7	26.4	73.0	43.0	76.0	26.2	96.6	23.1	24.1	82.0
DC8 - (WDxCO109)(CO106xCO110)	76.5	26.4	91.0	18.8	80.5	24.4	74.0	44.0	73.0	28.0	104.8	20.6	23.6	83.3
DC9 - (WDxW59E) (CO111xCO109)	63.5	27.5	93.0	18.3	88.3	18.5	73.0	44.0	84.0	26.5	100.6	22.7	22.7	83.7
DC10- (WDxCO109)(CO111xCO107)	70.2	24.9	88.0	17.8	82.1	18.9	68.0	45.0	86.0	27.0	98.6	20.8	21.9	82.2
MAINE 140	56.5	30.5			71.5	22.3	67.0	40.0	77.0	31.0	97.0	22.3	26.5	73.8
WIS. 255	63.5	26.4	81.0	20.5	78.0	23.3	60.0	44.0	76.0	26.0	92.8	23.5	23.9	75.2
W 270	61.9	29.7			85.9	24.1	62.0	49.0	81.0	31.4	98.4	24.1	27.3	77.8
A.E.S. 101	73.4	24.8	68.0	18.1	62.1	20.3	57.0	40.0	64.0	27.8	79.1	20.4	22.3	67.3
A.E.S. 201	59.0	31.5			78.4	27.4	58.0	46.0	77.0	29.6	90.3	22.5	27.8	72.5
N.E.144(ME 244)	69.0	25.4	93.0	20.2	69.8	24.9	67.0	42.0	84.0	26.6	101.7	22.2	23.9	80.8
ES. EXP.200	65.8	24.3			61.8	21.6	66.0	40.0	74.0	28.0	92.1	22.7	24.2	71.9
WARWICK 210	64.4	29.4			67.1	28.2	57.0	46.0	78.0	28.6	96.0	23.3	27.4	72.5
PENN. 215	68.2	30.8	100.0	21.9	89.5	29.7	69.0	48.0					27.5	81.7
PENN. EXP.(200)	63.6	31.6	114.0	22.2									26.9	88.8
WIS. 273			96.0	20.4			63.0	49.0					20.4	79.5
L.S.D. (5%)			6.8		11.9		7.3							
Date Planted	May 20		-	-	May 27		May 28-29		May 4		May 20			
Date Harvested	Oct. 9		-	-	Oct.22		Oct. 1-2		Aug.27		Sept. 30			

[1]Data analyzed by Duncan's Multiple Range Test.
[2]Averages of 3 tests.
[3]% H_2O not included in averages.

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 300-500 MATURITY

1. Suggested double cross hybrids for uniform testing:

   a. NY Expt. (Oh51A x B8)(NY 821 x NY 703)
   b. NY Expt. (NY 821 x NY 703)(NY D410 x NY D65)
   c. Pa 475 (W 153R x Pa54)(Pa 32 x Pa33)

   Suggested check hybrids are:

   a. Cor M4
   B. NE 310
   c. NE420
   d. Pa444

2. Seed of two (2) top cross tests (25 entries each) were made by NY, ES, and Pa during 1959 for cooperative testing in 1960. Wide testing is desired!

Test #1 (Cor M4 as tester parent)

1.	NY D4	13.	A 374
2.	NY D16	14.	W 153R
3.	NY 203	15.	W 182D
4.	NY 697-1	16.	W 182B
5.	NY 703-1	17.	W 37A
6.	NY 709-2	18.	W 33
7.	NY 821 C16	19.	Pa 407
8.	ES 191-34A (S5) -3-1-2-2-1	20.	Pa 403
		21.	Pa 172A
9.	ES X55-157-1 (S5)-1-1	22.	Pa 55
10.	ES 191-71(S5)1-1-A-1	23.	Pa 41
11.	C 153	24.	Pa 32
12.	A 509	25.	Tester Parent

Test #2 (NE 420 as tester parent)

1.	NY D4	6.	Pa 410
2.	NY D62	7.	ES 352-101-1-5-2-2-A
3.	NY D65	8.	ES 351-101-1-6-2-1-A
4.	NY D410	9.	Pa 406
5.	Pa 408	10.	Pa 407

Test #2 (NE 420 as tester parent)

11. Pa 409
12. Pa 423
13. Pa 55
14. Pa 270
15. Pa 283
16. Pa B8A
17. Pa B8B
18. Pa 109
19. Pa 41
20. Pa 31
21. Pa 37
22. R 168
23. Oh26
24. Oh51
25. Tester parent

H. L. Everett
H. M. Yegian
G. Gorsline, Chairman

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 600-700 MATURITY

The committee recommends that the following ten inbreds be crossed in all possible combinations in 1960, by two members, for cooperative regional testing in 1961.

It is proposed that regional trials include evaluation for such seed parent qualities as shelling percent, test weight, and percent flat grades, etc., as well as the usual agronomic characters of yield, maturity, stalk and root quality, and disease and insect resistance.

Connecticut	C103, C114
ESFX	601E, 603E
New Jersey	J48
Ohio	Oh51A, Oh43
Pa.	Pa83, Pa881P
Pa. F.B.	75F

Harry Stinson
Daniel Butler

REPORT OF THE COMMITTEE ON UNIFORM TESTS OF 800-900 MATURITY

No cooperative work was done in 1959.

Two sets of topcrosses are available from Pennsylvania for testing. One set of 29 inbreds has U.S. 13 as tester parent and the other set of 36 has Conn. 845 as tester. It is planned to have duplicate plots (minimum) with as many cooperators as are willing.

J. C. Anderson

REPORT OF THE COMMITTEE ON POLLINATING SUPPLIES

Cooperative purchase of 200,000 tassel bags 7" x 4 3/4" x 15½" of Kraft simplex, 40# wet strength bags sealed throughout with water-proof adhesive was made in 1959 for five conference members. These bags were purchased from the Union Bag Company, low bidder, at a cost of $7.67/M.

The Committee is arranging the cooperative purchase of ear shoot bags for 1960. Seven conference members have expressed interest.

H. E. Everett
R. S. Snell
D. L. Matthews, Chairman

REPORT OF THE COMMITTEE ON NOMENCLATURE OF CYTOPLASMIC STERILITY

This committee offered no formal report but reviewed the present usage. The suggestion was reiterated that the simplest terminology with present acceptance should be followed.

REPORT OF THE COMMITTEE ON STALK ROT
(Appended)

It was decided that the future program will follow the same pattern as has been established over the past two seasons. Double cross hybrids from single crosses tested previously will be grown at the cooperating stations in 1960 and field notes taken following established techniques. The inbreds L317, Os420, and Pa54 will be eliminated and J48 and WF9 added. Other resistant inbreds will be added as they become available.

Wernham pointed out the desirability of having at least a few common entries with the northcentral corn conference tests. This suggestion along with the list of northeast entries will be brought to the attention of the northcentral group by Dr. Rossman.

Part I - N.E.C.I.C. Project on Stalk Standability

The cooperative project on stalk standability initiated in 1958 by members of the Northeastern Corn Improvement Conference was continued in 1959. Inbreds selected by the members, and single cross hybrids made from these inbreds in New Jersey in 1958 were planted in Connecticut, Maryland, New Jersey, New York, and Pennsylvania. Refractometer readings for sugar content of stalks were taken at harvest time at Connecticut, and standability data were collected at Maryland, New Jersey, New York and Pennsylvania. Silking and grain moisture data were recorded at most of these locations, and leaf blight estimations were made in addition at New Jersey.

A summarization of the refractometer readings and the standability data are given in Table 1. Although previous work at Connecticut showed a positive correlation between high sugar and stalk rot resistance, the 1959 data on sugar content of stalk juice did not reveal such a relationship for the NECIC entries. Evidence of marked differences in standability between these entries in other locations suggests that sugar content of the stalks was not an important factor in separation of inbreds and hybrids for resistance in 1959.

In spite of the many variables implicit in a study of this kind, some interesting observations on standability in 1959 may be made:

1. Inbreds Pa54 and Os420 showed poor standability, and this character was carried over into most of the single cross hybrids made with these inbreds.

2. Oh51A was weak-stalked as an inbred but showed an unusual prepotency for stalk strength in single crosses made with it.

3. Inbreds Oh51A, A401, Oh26, Oh43, 38-11, C103 and Oh07 look promising for inclusion in future breeding for stalk strength.

4. Maturity of inbreds is an important factor in the northern portion of the Northeast Division. Oh51A, A401, Oh43, and possibly Oh26 may be used in this area, but the other inbreds would be too late.

5. Single cross hybrids in both the short season and full season groups look promising, e. g., Oh26 x Oh51A, C103 x Oh07.

Table 2. Summary of data on refractometer readings and standability of corn entries in 1959 N.E.C.I.C. Cooperative Experiment.

Entry	Refract. reading of stalks	Percentage stand of plants at maturity				
	Conn.	Md.	N.J.	N.Y.	Pa.	Av.
SINGLE CROSSES						
Short Season						
Oh26 x Oh51A	6.9	99	98	100	81	95
A401 x Oh51A	5.5	38	82	99	91	78
Oh43 x Oh26	5.7	55	76	99	76	77
A401 x Oh26	5.6	45	63	99	97	76
Oh43 x Oh51A	4.9	55	61	100	71	72
Pa54 x Oh51A	4.5	60	68	97	56	70
A401 x Oh43	4.2	41	38	99	92	68
Pa54 x Oh26	5.3	33	18	100	39	48
A401 x Pa54	4.7	24	6	100	59	47
Pa54 x Oh43	4.6	15	13	91	44	41
Full Season						
C103 x Oh07	5.6	76	75	100	84	84
38-11 x Oh43	5.5	67	30	100	93	55
Oh43 x C103	3.9	74	62	97	69	76
38-11 x Oh07	6.4	70	59	99	73	75
L317 x Oh07	6.4	73	63	100	55	73
38-11 x C103	5.7	63	30	98	91	71
38-11 x Os420	5.7	58	46	100	63	67
L317 x Oh43	5.5	59	43	100	55	64
L317 x C103	5.4	46	36	100	64	62
38-11 x L317	5.5	58	30	100	59	62
Oh43 x Os420	5.4	47	22	96	53	55
Os420 x Oh07	5.0	58	55	95	11	55
Oh43 x Oh07	4.6	43	51	88	9	48
Os420 x C103	5.0	58	5	98	21	46
L317 x Os420	5.5	31	37	80	5	38
INBREDS						
A401	5.0	--	60	96	57	69
Oh26	7.6	--	87	96	11	65
Oh43	4.9	35	73	88	37	58
Oh51A	6.3	39	55	35	44	43
Pa54	6.3	--	5	65	3	24
38-11	3.8	81	98	99	93	92
C103	4.2	91	100	97	65	88
L317	---	91	95	98	27	78
Oh07	8.5	65	100	100	44	77
Os420	6.7	48	58	33	1	35

Part II - Cooperative Stalk Rot Project, Harrow, Canada; New Brunswick, New Jersey and Ithaca, New York

A second experiment on stalk standability was conducted, this is a study of the stalk rot disease induced artificially in comparison with that occurring naturally, in three locations in the northeast, 1) Harrow, Canada, 2) New Brunswick, New Jersey, and 3) Ithaca, New York. Seed of several inbreds and hybrids from a single source were planted and half of the mature plants at each location were inoculated with Gibberella. The other half were left for observation of natural infection. A Harrow isolate of Gibberella was used at Harrow, an isolate from New Jersey was used at New Brunswick, and an isolate from New York was used at Ithaca.

Table 3 is a summary of data obtained at the 3 locations. All entries inoculated at Harrow revealed a high amount of stalk rot, with the possible exception of J47. These results were comparable with those reported previously by these workers, i.e., all entries showed high amounts of rot when inoculated artificially with Harrow isolates of G. zeae. The incidence of natural infection at Harrow varied considerably between entries, ranging from 0 to 100%.

The amount of rot developing after artificial inoculation of entries at New Brunswick and at Ithaca was less than that in the Harrow entries; however, there was little correlation between the degree of rot and the reputed field resistance of these lines. Stalk breakage from natural infection of the entries also failed to correlate with expected field performance based on previous observation.

Table 3. Summary of data for entries artificially inoculated with Gibberella zeae and naturally infected, Harrow, Ontario; New Brunswick, New Jersey, and Ithaca, New York, 1959.

Entry	'Previous' 'field 'standa- 'bility'	% disease (artificial inoc.)			% breakage (natural infection)		
		Harrow	New Brunswick	Ithaca	Harrow	New Brunswick	Ithaca
		Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
Pa54	Poor	100	64	66	97	83	51
A158	Poor	100	64	30	100	56	93
Oh26	Good	100	92	75	-*	27	14
CH157	Poor	100	86	75	42	11	11
CH9	Good	85	64	46	0	30	36
J47	Good	50	58	27	3	8	0
J48	Poor	78	61	50	3	19	36
NY3 x D50	Poor	88	70	72	0	17	0
Oh51A z B8	Good	83	49	34	0	52	9
CH157 x CH9	Good	90	72	43	0	48	26
Cornell M4	Good	93	57	43	11	60	20

* Roots and interior of plants rotted but plants erect.

C. W. Boothroyd, Chairman
R. A. Cappellini
C. C. Wernham
N. J. Whitney

REPORT OF THE COMMITTEE ON THE PRESERVATION OF OPEN-POLLINATED VARIETIES

No formal report was presented but Dr. Bailey noted that 1621 accessions have been listed. This listing is available to interested workers from Dr. D. Dolan, Plant Introduction Station at Geneva, New York.

Disease Resistant Synthetics of Corn Germ Plasm

C. C. Wernham

The administrative policy of this University makes clear that any maize germ plasm in any stage of breeding may be released to the general public provided that said item of germ plasm is not involved in a station hybrid. In the latter situation a policy of delayed release is adhered to.

You may recall that up to the present, six synthetics carrying genes for disease resistance have been available. Three of these were released from this department in 1954 and were arbitrarily designated, Early, Intermediate and Late. Small lots of seed of these are still available from a renewal planting in 1957.

We wish to announce the following additional ones:

(a) Sweepstakes synthetic; O.P. 2 (Open pollinated twice)
(b) Early synthetic No. 2; O.P. 1
(c) South African-American; O.P. 3
(d) " " " ; Stiff stalked selection, O.P. 2
(e) In many cases the S_2 or S_3 components of these synthetics are available as individual ear selections. (See description notes and policy notes.)

Description of Synthetics

In general, these recent synthetics have a broader genetic base than the original three. They have been subjected to more diseases over a longer period of time.

Sweepstakes Synthetic

Westbranch Sweepstakes (originated along the West branch of the Susquehanna river) is widely adapted in the northeast, just north of the range of Lancaster Surecrop. It has fairly long ears with flat kernels. The seed has a red pericarp with a yellow or white cap.

About 1000 plants were grown in a mixed planting of the Early, Intermediate and Late Synthetics and detasselled. The whole planting was treated as a disease nursery. The most resistant plants were selected and the seed bulked. Samples were taken of this bulked seed and were planted, inoculated, selfed and selected for two seasons. The surviving S_2 cultures were reconstituted into a synthetic in an isolation block. To date the Synthetic segregates about two percent yellow ears. It has shown remarkable resistance.

Early Synthetic No. 2.

Strains of "Early Butler", "College Whitecap", "Early Sweepstakes", a long-fellow flint and an early yellow dent, were detasselled and top crossed at the same time as the Sweepstakes described above. In the disease nursery particular attention was paid to early maturity. The Synthetic was made up of S_2 and S_3 lines, pollinated 7/25 to 8/3 from a May 12 planting. This has been in isolation one season only and the seed is as variable as the lines which comprise it.

S_2 and S_3 components of this Synthetic are available as individual ears. (See note at end of announcement)

South African-American Synthetic

This Synthetic shows promise as a source of stalk strength as well as disease resistance. It is made up of American breeding material which survived the prolonged drought of 1955 and which remained erect following a subsequent hurricane, crossed with South African inbreds which were selected for their remarkable resistance to Helminthosporium turcicum, the causal agent of Northern leaf blight.

The South African-American Synthetic is somewhat later than the Sweepstakes, which in turn is later than Early Synthetic No. 2.

The stiff stalked selection consists of bulked seed of 94 plants still erect and sturdy Dec. 15, 1959.

Seed of individual ears of these stiff stalked plants is available.

Note regarding requests for disease resistant early generation inbreds

The corn disease nursery at this station consists of about 1000 10-foot rows of early generation inbreds. We seldom keep anything beyond the S_4 generation at which time, the choice selections are turned over to the Corn breeders in Agronomy for agronomic evaluation. (209 wuch cultures were given the Agronomists in 1958). We expect an

evaluation report on the combining ability of these cultures, when such information becomes available. In that way, disease resistant inbreds already produced can become available to improve germ plasm at some future date.

We expect and ask for this same type of cooperation from any individual outside this station. We are glad to share our material with you, but our program cannot be nurtured unless we in turn receive credit. We really believe we have something worth while sharing.

Furthermore, I am not interested in packeting small numbers of inbreds of specific maturity dates. Unless you want 50-100 items, why not develop your own from the Synthetics available.

REPORT OF THE COMMITTEE ON THE INBRED RELEASE POLICY

This committee convened a special meeting in Harrisburg, Pennsylvania on April 7, 1959 and submitted the following:

Interpretation of Northeastern Corn Improvement Conference three year delayed release as applied to non-university members of the Northeastern Corn Improvement Conference.

Non-university members are obligated to release inbreds in the third year of commercial distribution of the hybrid containing such inbred to any university member of the Northeastern Corn Improvement Conference upon request and providing such university uses such inbred in a recommended hybrid.

Upon release to a university an inbred of a non-university member of the conference will be further released only as foundation single cross (SX) seed until the third year of commercial distribution of the hybrid containing such inbred recommended by the university, at which time such inbred may be released to the public by the university.

New inbreds defined

There shall be no obligatory release of inbreds altered only to facilitate and expedite production of hybrid seed. Inbreds which will change performance of the hybrid in the farmer's fields will be considered as new inbreds when subject to release.

Sharing defined

The unilateral exchange of breeding material between two individuals. All such exchange must be with the originator.

The material shared is unrestricted in its use for research development.

The material shared may not be used for commercial purposes without written permission of originator.

Walter Thomas
David Matthews
George Gorsline
Herbert Everett
Daniel Butler
Ronald Anderson
John Anderson, Chairman

It is suggested that members who have not complied with the requirement for membership in the Northeast Corn Improvement Conference with respect to their policy of inbred release make every effort to do so by the time of the 1962 meeting of this body.

NEW BUSINESS

(1) Chairman Johnson appointed the following as the committee on corn silage research:

R. Anderson, Chairman
F. Dimmock
M. W. Johnson
C. E. Manchester
W. I. Thomas

This committee was charged to bring a report on silage research findings and progress to the 1961 conference.

(2) The general approval of the conference was seen for the tentative meeting dates February 24-25 or March 10-11, 1961. Final choice was left to the discretion of the chairman. A motion by Anderson stated that the meeting time begin on Friday morning at 9:00 (with luncheon and registration to cover costs). Seconded by Matthews.

Carried unanimously.

REPORT OF THE NOMINATING COMMITTEE

(3) Dr. J. Anderson reported the nomination of Dr. Stinson for Vice-Chairman of the 1960-61 conference. The nomination was seconded by Dr. Jones who then moved that the secretary be instructed to cast a unanimous ballot for Dr. Stinson. This motion was seconded and passed.

This completed the formal program. Chairman Johnson called upon the next Conference Chairman, Dr. Dimmock for a few words. Dimmock stated that he looked for a successful 1961 conference and counted on members for continued cooperation in developing the program.

The meeting adjourned at 12:00 noon.

ROSTER OF ATTENDANCE

Canada		
Brawn, Robert I.	Macdonald College	Montreal
Dimmock, Fred	Central Expt. Farm	Ottawa
Connecticut		
Jones, D. F.	Agric. Expt. Station	New Haven
Stinson, H. T.	" " "	" "
Maine		
Bailey, R. M.	University of Maine	Orono
Maryland		
Rothgeb, R. G.	University of Maryland	College Park
Massachusetts		
Manchester, C. E.	Eastern States Farmers' Exch.	W. Springfield
Matthews, D. L.	" " " "	"
Yegian, H. M.	University of Massachusetts	Amherst
Michigan		
Rossman, E. C.	Michigan State University	East Lansing
New Jersey		
Anderson, John C.	Rutgers University	New Brunswick
Chow, Nuo-Pao	" "	"
Peterson, J. L.	" "	"
New York		
Anderson, R. E.	Cornell University	Ithaca
Boothroyd, C. W.	" "	"
Everett, H L.	" "	"
Liu, H. Z.	" "	"
Miller, R. E.	" "	"
Sidhu, B. S.	" "	"
Wheeler, D. A.	" "	"
Ohio		
Dollinger, E. J.	Ohio Agr. Expt. Station	Wooster

Pennsylvania

Butler, Dan.	Penna. Farm Bureau	Harrisburg
Bratzler, J. W.	Penna. State University	State College
Fortmann, H. R.	" " "	"
Gorsline, G. W.	" " "	"
Thomas, W. I.	" " "	"
Wernham, C. C.	" " "	"

Washington, D. C.

Heerman, R. M.	SESD, U.S.D A.	D.C.

West Virginia

Crum, C. W.	University of West Virginia	Morgantown
Johnson, M. W.	" " "	"

OFFICERS AND COMMITTEE MEMBERSHIP, 1960

Administrative Advisor

H. R. Fortmann

Executive Committee

F.Dimmock, Chairman
H. T. Stinson, Vice-Chairman
M. W. Johnson

Committee on Registration of NE Hybrids

D. F. Jones, Chairman
R. Funk
R. G. Rothgeb

Committee on Uniform Tests of 100-200 Maturity

W. I. Thomas, Chairman
R. M. Bailey
R. I. Brawn
F. Dimmock
H. L. Everett

Committee on Uniform Tests of 300-500 Maturity

G. Gorsline, Chairman
H. L. Everett
H. M. Yegian

Committee on Uniform Tests of 600-700 Maturity

D. L. Matthews, Chairman
H. T. Stinson
D. Butler
R. Funk

Committee on Uniform Tests of 800-900 Maturity

J. C. Anderson, Chairman
R. G. Rothgeb
M. W. Johnson

Committee on Pollinating Supplies

D. L. Matthews, Chairman
R. S. Snell
M. W. Johnson

Committee on Nomenclature of Cytoplasmic Sterility

D. F Jones, Chairman
R. S. Snell
H. L. Everett

Committee on Stalk Rot Disease

C. W. Boothroyd, Chairman
J C. Anderson
C. C. Wernham
R. Cappellini
J. L. Peterson
N. J. Whitney

Committee on the Preservation of Open-Pollinated Varieties

R. M. Bailey, Chairman

Committee on Inbred Release Policy

J. C. Anderson, Chairman
D. Butler
H. L. Everett
D. L. Matthews
G. Gorsline
W. I. Thomas

Committee on Corn Silage Research

R. Anderson, Chairman
F. Dimmock
M. W. Johnson
C. E. Manchester
W. I. Thomas